

TABLE 8.—*Harqua Hala and Montezuma values, October, 1920, to September 20, 1922—Continued.*

		H. H. solar constant.					Montezuma solar constant.							Weighted mean.	Grade.
		1.3	2.0	2.7	Mean.	Grade.	1.5	2.0	2.5	3.0	Long.	Mean.	Grade.		
1922															
May	30	932	...	...	932	U+								1.932	U+
	31	915	913	...	914	U+								1.914	U+
June	1	931	914	...	922	S								1.913	S
	2	931	...	...	931	S								1.917	S
	3	942	944	941	943	S	915	924	906	911		903	S	1.931	S
	4	938	928	...	933	S								1.933	S
	5	927	931	...	929	S								1.929	S
	6	934	944	944	940	S								1.940	S
	7	941	940	...	940	S	903	888	876			889	U	1.940	S
	8	942	...	...	942	U								1.942	U
	9	944	933	...	948	S								1.948	S
	10	937	951	949	945	S								1.945	S
	11	...	941	...	941	S								1.941	S
	12	925	...	...	925	U								1.925	U
	13	925	925	913	921	S								1.913	S
	14	920	928	913	921	S	931	898	905	923	934	905	S	1.922	S
	15	923	930	...	930	S								1.930	S
	16	918	908	914	913	S								1.913	S
	17	921	908	...	910	S								1.910	S
	18	904	886	...	895	S								1.892	S
	19	882	881	...	882	S								1.882	S
	20	880	...	...	880	S								1.880	S
	21	...	...	...	...	S								1.880	S
	22	897	...	...	897	U+								1.897	U+
	23	...	...	...	...	S								1.897	S
	24	892	898	...	895	S								1.895	S
	25	908	902	909	908	S								1.898	S
	26	890	877	880	880	S								1.880	S
	27	908	908	...	908	S								1.908	S
	28	900	958	...	959	S								1.948	S
	29	900	...	...	900	S								1.900	S
July	1	920	...	...	920	U+	920	898	901	918		907	S	1.918	S
	2	864	...	...	864	U+								1.864	U+
	3	908	...	...	908	S	898	870	870	870		893	S	1.893	S
	4	896	...	...	896	S								1.896	S
	5	882	871	920	883	S								1.883	S
	6	...	...	...	...	S								1.883	S
	7	...	...	...	...	S								1.882	S
	8	884	870	901	882	S								1.882	S
	9	900	896	...	898	S								1.898	S
	10	905	918	...	911	S								1.911	S
	11	927	...	...	927	S								1.927	S
	12	...	914	945	929	S	925	917	896			916	S	1.921	S
	13	...	943	930	936	S								1.912	S
	14	905	916	913	912	S								1.912	S
	15	896	910	...	903	S	929					929	S	1.920	S
	16	907	...	...	907	S								1.907	S
	17	906	...	...	906	S								1.906	S
	18	916	...	...	916	S								1.916	S
	19	...	...	...	...	S								1.892	S
	20	892	...	...	892	U								1.892	U
	21	950	943	...	947	S								1.947	S
	22	926	933	929	929	S								1.929	S
	23	925	...	...	925	S								1.925	S
	24	926	...	...	926	S								1.926	S
	25	...	...	...	...	S								1.918	S
	26	918	...	...	918	U								1.907	U
	27	928	...	...	928	S								1.907	S
	28	...	...	...	...	S	927	917	887			907	S	1.927	S
	29	903	...	...	903	U								1.903	U
Aug.	1	...	...	...	...	S	920	883				908	S	1.908	S
	2	...	...	...	...	S								1.912	S
	3	911	901	933	912	S								1.912	S
	4	913	917	...	915	S								1.915	S
	5	889	...	...	889	U								1.915	S
	6	...	...	...	...	S								1.931	S
	7	...	...	...	...	S								1.931	S
	8	...	...	...	...	S	931					931	S	1.931	S
	9	...	...	...	...	S								1.903	S
	10	...	...	...	...	S								1.927	S
	11	921	...	...	921	S	921	934	903	926	976	903	S	1.927	S
	12	...	...	...	...	S								1.945	S
	13	943	946	...	945	S								1.920	S
	14	920	...	...	920	U+								1.905	U+
	15	905	...	...	905	S								1.905	S
	16	...	...	...	...	S								1.907	S
	17	...	...	...	...	S								1.907	S
	18	...	...	...	...	S								1.907	S
	19	...	...	...	...	S								1.907	S
	20	...	...	...	...	S								1.907	S
	21	943	...	...	943	U								1.907	S
	22	...	...	...	...	S								1.901	S
	23	...	...	...	...	S								1.915	S
	24	895	910	895	901	S								1.920	S
	25	...	916	942	925	S								1.934	S
	26	...	912	937	920	S								1.936	S
	27	908	935	971	931	U	937	941	909			908	S	1.937	S
	28	...	943	921	936	U								1.936	U
	29	923	929	...	926	U								1.917	U
	30	912	...	...	912	U+	917					917	S	1.917	U+
Sept.	1	935	939	...	937	U+								1.937	U+
	2	...	...	...	...	S								1.890	S
	3	892	888	...	890	S								1.890	S
	4	927	955	929	939	S								1.939	S
	5	928	...	...	928	S								1.929	S
	6	...	...	...	...	S								1.929	S
	7	...	...	...	...	S								1.929	S
	8	...	...	...	...	S								1.929	S

* Small figures like exponents indicate number of observations used in obtaining the mean.

TABLE 8.—*Harqua Hala and Montezuma values, October, 1920, to September 20, 1922—Continued.*

		H. H. solar constant.					Montezuma solar constant.							Weighted mean.	Grade.
		1.3	2.0	2.7	Mean.	Grade.	1.5	2.0	2.5	3.0	Long.	Mean.	Grade.		
1922															
Sept.	9	919	946	...	928	S								1.928	S
	10	919	900	891	905	S								1.905	S
	11	916	...	...	916	S								1.916	S
	12	900	919	946	916	S								1.916	S
	13	...	...	...	...	S								1.885	S
	14	884	884	872	885	S								1.885	S
	15	881	876	...	879	S	936	920	925			936	U	1.879	S
	16	871	...	...	871	S						927	S	1.899	S
	17	...	857	859	857	U?								1.857	U?
	18	866	...	...	866	S								1.866	S
	19	860	830	804	864	U?								1.860	U?
	20	861	873	...	867	S								1.900	S

* Small figures like exponents indicate number of observations used in obtaining the mean.

DENSE FOG IN THE TRI-CITIES ON NOVEMBER 3, 1922.

E. E. UNGER, Observer.

[Weather Bureau Office, Davenport, Iowa, February 28, 1923.]

London had nothing on the Tri-Cities in the matter of fog this morning, up to nearly 9. One of the densest fog blankets which ever settled over this section enveloped the community, making it impossible for pedestrians and autoists to see even as far as across the street.—From *The Moline Dispatch*, November 3.

What may be characterized as the heaviest fog, or at least one of the heaviest, that ever occurred in the Tri-Cities (Davenport, Iowa, and Rock Island and Moline, Ill.), began as light fog at about 1 a. m. on Friday, November 3, 1922, changing to dense fog at about 2 a. m. and continuing dense to about 9 a. m. after which light fog prevailed to about 1 p. m.

Between the hours of 6 and 8 a. m., when the fog was apparently the heaviest, the curbs across the streets, shrubbery in yards, openings in buildings, and pedestrians were entirely invisible to one at distances of from 40 to 50 feet, while large objects, such as automobiles, buildings and the like could not be seen even faintly 50 to 75 feet away. Lights on automobiles, locomotives, street cars, and street lights could not be distinguished at distances of 125 to 300 feet away, depending on their intensity.

Different persons were called up on the telephone from the Weather Bureau office during the forenoon of November 3, in most cases before the fog had dissipated, and questioned relative to the density of the fog and the visibility. It is thought that most of the distances given are fairly accurate, due to the fact that generally they were supplemented in terms of width of street, length of block, width of city lot, etc., thus "Can not see house across street," "Could not see opposite curb from walk," "A person crossing the street becomes invisible when stepping up on opposite curb," "Could not see an automobile down town at the distance of the width of the street," "Could first see lights of approaching automobile about a half block away," and the like. The width of streets in the residential sections of the Tri-Cities average about 30 feet from curb to curb, while in the business sections they probably average about 60 feet.

The fog would compare favorably in intensity with the heavy fogs common at stations on the Atlantic and Pacific coasts. However, the formation of such a heavy fog in the Middle West is quite unusual. Light fogs in this section are not infrequent, especially during the autumn and winter months, but dense fogs where one can not see the faint outline of a building by day or a street light by night at a distance of 500 to 700 feet have never occurred

before in the Tri-Cities as far as is known, except possibly over very limited areas. It has been noted that, for the 30-year period, 1893 to 1922, inclusive, 10,956 days, the record at the Davenport station shows 213 days with dense fog. In other words, there has been only one day with dense fog out of every 51 days during the past 30 years.

Although the fog may have extended much farther, it is known that dense fog prevailed along the Mississippi River from Princeton, Iowa, about 20 miles upstream from Davenport, to Muscatine, Iowa, about 30 miles downstream. Its probable extent inland on either side of the Mississippi was from 2 to 5 miles. However, the area of denser fog apparently extended from east of Moline due westward and northwestward over the Tri-Cities to considerably beyond Nahant, a distance of about 10 miles, with the densest fog overlying parts of Moline and Rock Island. In Davenport, the dense fog seemed to be broken here and there by spots where one could see objects from 500 to 1,000 feet distant, and from where the cloudlike tops of the denser fog areas could be faintly distinguished. From the latter it was estimated that the thickness of the fog was probably 600 to 800 feet.

Referring to the weather map on the morning of November 3, it will be noted that high pressure prevailed

over Iowa and Illinois and that there was little or no wind. The rainy weather of November 1, followed by entirely overcast skies until about 10 p. m. on November 2, resulted in high humidity, the relative humidity at 7 p. m. on November 2 being 79 per cent at a temperature of 54°. A cubic foot of air at a temperature of 54°, with a relative humidity of 79 per cent, contains approximately 3.73 grains (troy) of water vapor. By cooling, a cubic foot of air with a water vapor content of 3.73 grains (troy) reaches the point of saturation at a temperature of about 47.3°. From 7 p. m. of the 2d to 2 a. m. of the 3d, the temperature on the roof of the post-office building in Davenport dropped from 54° to 48°. It will be noted that the fog changed from light to dense at about 2 a. m. The temperature continued to fall slowly till about 7:30 a. m., when the minimum of 42.4° was recorded.

The weather conditions overlying the Tri-Cities on November 3 as pictured on the morning map, that is, high pressure, clear skies over the surrounding territory, and little or no wind movement, together with the conditions that prevailed locally during the preceding two days, were ideal for the formation of very heavy fog over this vicinity. The visibility during the fog was undoubtedly lessened by the presence of city smoke.

WINDSTORM AT INDEPENDENCE, CALIF., FEBRUARY 12, 1923.

By C. D. ASHER, Observer.

[Weather Bureau Office, Independence, Calif., February 27, 1923.]

The storm described in this note was remarkable in that it seems to have been a violent downrush of wind from the high Sierras immediately to the westward of Owens River Valley, extending in a north-south line for a hundred miles or more. At the time of the windstorm there was a cyclonic system that had moved inland and a little southeastward from the Oregon coast during the early morning of the 12th, 300 miles due north of Independence. Since it occurred in the early morning hours, vertical convection must be eliminated as a contributing cause. The absence of any whirling motion as indicated by the distribution of the debris seems to preclude the idea of a tornado, although the barograph trace, Figure 3, is quite suggestive of pressure fluctuations in a tornadic storm.—EDITOR.

A mountain windstorm of unprecedented severity for eastern California occurred on the Sierra side of Owens River Valley during the morning of February 12, 1923. The wind at Independence blew at the rate of 70 miles per hour or more from 3:30 a. m. to 5:30 a. m., and reached a maximum of 80 miles per hour from the southwest at 4:20 a. m. The direction of the wind varied from southwest to west, coming directly down from the mountains—the highest section of the Sierras. Much damage was done by the wind in a strip of country about 100 miles long along the highway from Levinning Valley in Mono County to some distance south of Olancha in Inyo County, the damage varying in intensity at different points. In Long Valley and Round Valley and approaching Big Pine considerable damage was done, while Bishop, Big Pine, and Lone Pine, all in the northern part of Inyo County, escaped with practically no destruction. At Aberdeen, Fort Independence, Independence, Manzanar, Cartago, and Olancha much damage was done. The Sierra Power Co. sustained the greatest individual loss. Forty-three of their big transmission-line steel towers, foundations and all, were wrecked. More than 90 pole structures of this company between Bishop and Hot Creek went down. The steel towers that were wrecked stood in the vicinity of Olancha, between Olancha and Lone Pine and between Big Pine and control station.

The Inter-State Telegraph Co. was probably the next heavy loser. A great part of their line through the valley was blown down. Their loss will exceed \$10,000.

Much damage was done to the power plant, belonging to the city of Los Angeles, at Division Creek and Cottonwood.

In the Aberdeen section north of Independence a number of houses were wrecked, but fortunately the occupants escaped injury; great damage was done to pumping plants, plowed fields, farming implements, trees, etc. In some cases the wind not only demolished houses but carried away household effects and wearing apparel.

The historic old mill on Oak Creek was demolished and the Mount Whitney Fish Hatchery further west on Oak Creek lost about half of its tiled roofing. In Independence the principal damage was to the new courthouse, although there was considerable private property loss. All homes were damaged to some extent. The courthouse damage will amount to about \$7,000. At least 24 of the large plate-glass window panes were demolished by the storm. About 500 trees in town were uprooted and many others broken off.

Further down the valley, at Cartago, five 3-room houses were overturned or wrecked and the store at Olancha was demolished.

It was not a tornado but a straight blow, which was evidenced by the fact that all the wrecked trees and houses throughout the territory were blown in the same direction, namely, toward the northeast. The most remarkable fact about the storm effect was the amount of sand, rocks, and debris that the wind carried along with it and the force with which it was carried. The roads were swept clean of sand, soil, and pebbles, leaving only the larger rocks. At some places windrows of gravel were made, leaving the ground not unlike an abandoned cornfield. Plowed fields were swept clean. The rain-